

Kunio MITUI*: Chromosome studies on Japanese ferns (2)

三井邦男*: 日本のシダの染色体の研究 (2)

This is a continuation of the previous paper (p. 117-124 of this Journal, 1965). Table I. is an arrangement of the new records on 31 species. Chromosome counts were made with the usual acetocarmine squash technique. I am indebted to Prof. H. Ito for valuable advice and for identification of the materials.

Cyrtomium. Since Allen's investigation (1914), many authors have studied several species of this genus cytologically. For example Manton (1950) investigated *C. caryotideum*, *C. falcatum* and *C. fortunei* and reported that these were triploid apogamous species ($n=123$). Fabbri (1956), P. N. Mehra (1961), Abraham, Ninan et Mathew (1962) and Kurita (1960) reported the same results as her. But I observed forty-one bivalents in meiosis in *C. balansae* (Fig. 9) and this specimen contained sixteen normal spore mother cells in a sporangium, therefore this may be a sexual species. This results ($n=41$) seems to support Manton's opinion (1950), that is, hybridization is a cause for the manifestation of apogamy.

Hymenophyllum. In *Hymenophyllum*, three basic numbers ($x=11, 13, 18$) are reported. I observed twenty-one bivalents in meiosis in *H. barbatum* and this number seems to be derived from $x=11$. On the other hand, P. N. Mehra and G. Singh (1957) reported the basic number $x=7$ for *Meringium* and $x=7, 9$ for *Mecodium* which are related morphologically to *Hymenophyllum*. Therefore the number ($n=21$) of this species seems to be derived from $x=7$. But more investigations are required for this conclusion.

Lepisorus. I observed twenty-five bivalents in meiosis (Fig. 14) and sixty-four normal spores in a sporangium in *L. thunbergianus*. I reported $n=50$ for this species in the previous paper (1965), therefore in Japan this species has two cytotypes, namely diploid and tetraploid. Such a case is observed in some species, for example *Phegopteris decursivepinnata*, *Athyrium conilii* and *A. pycnosorum*.

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私は前に日本産のシダの染色体数について発表したのが、今回あらたに 31 種類についての新知見を得たので報告する。表 1 と図がその詳細である。これらのうちで、ノキシノブは、ゲジゲジシダその他のものと同様に、二つの倍数体(二倍体、四倍体)をもつことが明らかになった。またいままで無配生殖をする種のみ知られていたヤブソテツ属にも、正常な有性生殖をおこなう種(ミヤジマシダ)があることがわかった。このことは無配生殖と交雑との関連性を示すように思われる。

Table 1. A list of chromosome numbers of some Japanese ferns

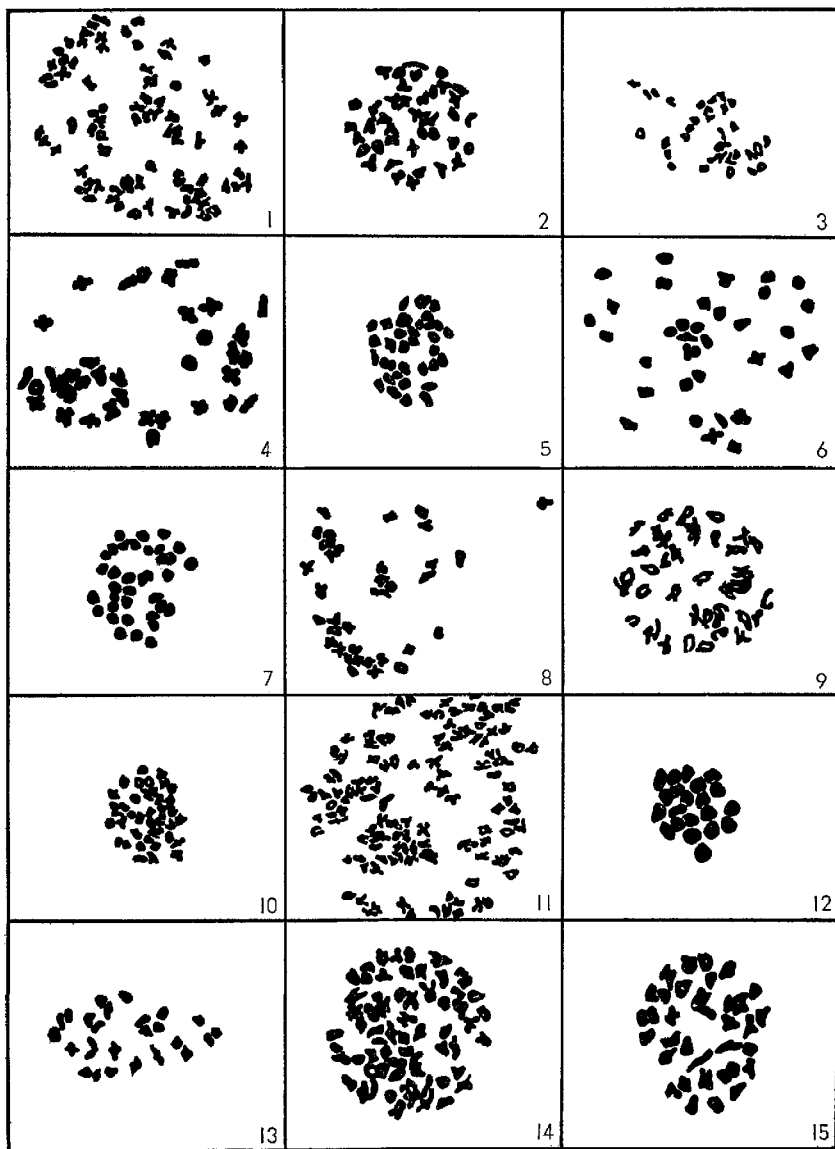
Name of species	Locality	Haploid chromosome number	Ploidy	Fig.
<i>Athyrium iseanum</i> Hosobainuwarabi	Obarano, Owase, Mie Pref.	80	4 x	1
<i>A. viridifrons</i> Midoriwarabi	T. U. E.*	40	2 x	2
<i>Blechnum orientale</i> Hiryūsida	Tainokawa, Yakusima, Kagosima Pref.	33	2 x	3
<i>Colysis elliptica</i> Iwahitode	Mikisato, Owase, Mie Pref.	36	2 x	4
<i>C. pothifolia</i> Oiwahitode	Asizuri, Kōti Pref.	36	2 x	5
<i>Crypsinus hastatus</i> Mitudeurabosi	Zinmuzi, Kanagawa Pref.	36	2 x	6
<i>C. yakushimensis</i> Himetakanohaurabosi	Miyanoura, Yakusima, Kagosima Pref.	36	2 x	7
<i>Cyclosorus gongylodes</i> Tetuhosida	Sugari, Owase, Mie Pref.	36	2 x	8
<i>Cyrtomium balansae</i> Miyazimasida	T. U. E.	41	2 x	9
<i>C. caryotideum</i> Meyabusotetu	Kuroyama, Saitama Pref.	123	3 x Apog.	
<i>Dryopteris hayatae</i> Inutamasida	Miyanoura, Yakusima, Kagosima Pref.	41	2 x	10
<i>D. varia</i> Itatisida	T. U. E.	123	3 x Apog.	11

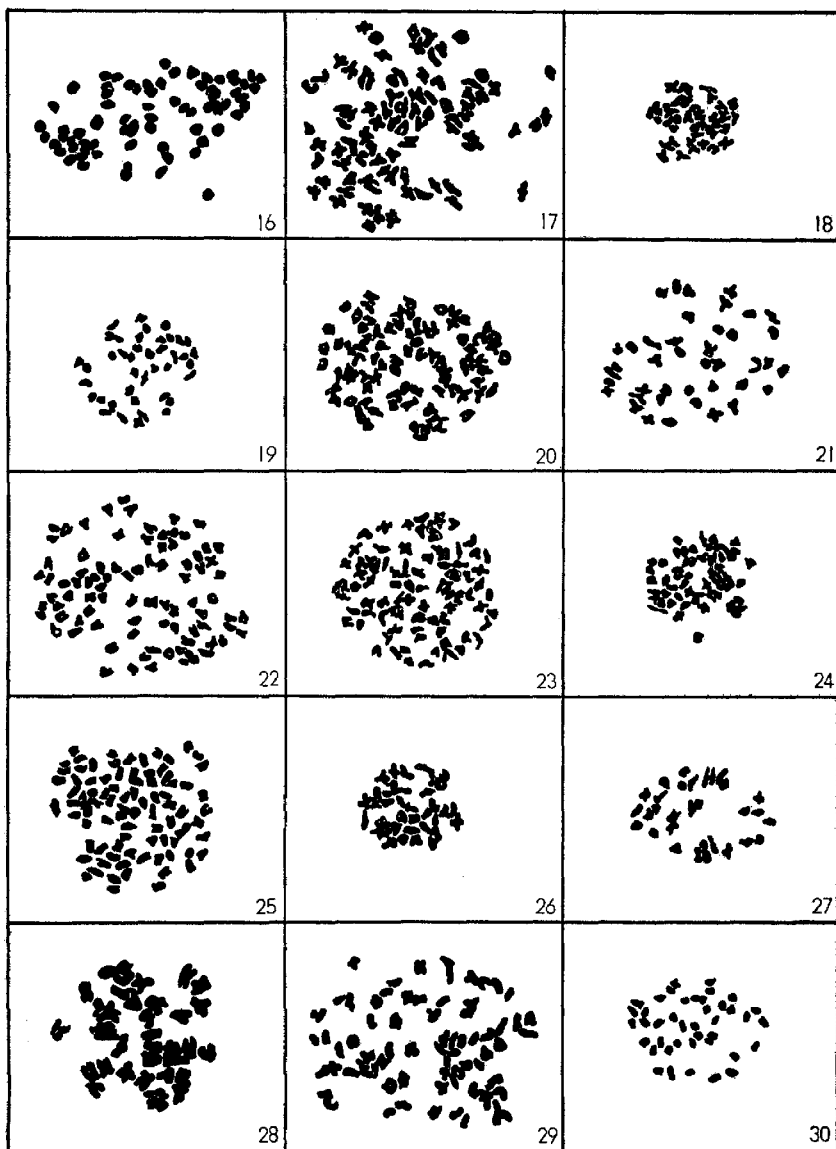
<i>Hymenophyllum barbatum</i> Kôyakokesinobu	Obarano, Owase, Mie Pref.	21	12	6 x
<i>Lepisorus thunbergianus</i> Nokisinobu	Hasimoto, Kanagawa Pref.	25	13	2 x
<i>Loxogramme saziran</i> Saziran	Sawadani, Naka-gun, Tokushima Pref.	70	14	4 x
<i>Microsorium hancockii</i> Hokozakiurabosi	Miyanoura, Yakusima, Kagosima Pref.	36	2 x	15
<i>Phyllitis scolopendrium</i> Kotaniwatari	Oku-kinu, Totigi Pref.	72	4 x	16
<i>Polystichopsis amabilis</i> Ôkanawarabi	T. U. E.	82	4 x	17
<i>P. nipponica</i> Midorikanawarabi	Hiradani, Naka-gun, Tokushima Pref.	41	2 x	18
<i>Polystichum crassipedosorum</i> Turudenda	Hutase, Saitama Pref.	41	2 x	19
<i>P. polyblepharum</i> Inode	Mituisiyama, Tiba Pref.	82	4 x	20
<i>P. polyblepharum</i> var. <i>fibrillosopaleaceum</i> Asukainode	Zinmuzi, Kanagawa Pref.	41	2 x	21
<i>Pteris cretica</i> var. <i>albolineata</i> Matuzakasida	U. T.**	87	3 x Apog.	22
<i>P. fauriei</i> Hatizyôside	Nakabase, Yakusima, Kagosima Pref.	87	3 x Apog.	23
<i>P. semipinnata</i> Ôamakusasida	Miyanoura, Yakusima, Kagosima Pref.	58	4 x	24
<i>P. setulosocostulata</i> Togehatizyôside	Miyanoura, Yakusima, Kagosima Pref.	87	3 x Apog.	25
<i>Pyrrosia linearifolia</i> Birôdosida	Izuhara, Naka-gun, Tokushima Pref.	37	2 x	26
<i>Sturuthiopteris niponica</i> Sisigasira	Obarano, Owase, Mie Pref.	31	2 x	27
<i>Vandenboschia auriculata</i> Turuhoragoke	Miyanoura, Yakusima, Kagosima Pref.	36	8 x	28
<i>V. radicans</i> Haihoragoke	Izuhara, Naka-gun, Tokushima Pref.	72	16 x	29
<i>Woodsia macrochlaena</i> Koganesida	Hutase, Saitama Pref.	41	2 x	30

Abbreviations:

* T. U. E. Fern garden of Tokyo University of Education.

** U. T. Koishikawa Botanical Gardens of University of Tokyo.

Figs. 1-15. Numbers correspond to those in tab. 1. $\times 600$.



Figs. 16-30. Numbers correspond to those in tab. 1. $\times 600$.